

REMARKS/ARGUMENTS

In the Office Action dated June 5, 2007 claims 1, 5-6, 8-12, and 17-19 were rejected under 35 U.S.C. §103(a) as being unpatentable over Wilson, U.S. Patent No. 5,414,232 (“Wilson”) in view of Brown et al. U.S. Patent Publication No. 2003/0118762 (“Brown”). Claims 2-4 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Wilson in view of Brown, and further in view of Arcas et al., U.S. Patent No. 5,175,401 (“Arcas”). Claim 7 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Wilson in view of Brown, and further in view of Kraft, U.S. Patent No. 6,182,787 (“Kraft”). Claims 13-16 were rejected under 35 U.S.C. §103(a) as being unpatentable over Wilson in view of Brown, and further in view of Lowery et al., U.S. Patent No. 5,962,107 (“Lowery”). Claims 20 and 21 were rejected under 35 U.S.C. §103(a) as being unpatentable over Wilson in view of Brown, and further in view of Ely et al. U.S. Patent No. 4,291,080 (“Ely”). Claims 22-25 were rejected under 35 U.S.C. §103(a) as being unpatentable over Wilson in view of Brown, and further in view of Lowery.

Claims 1-25 are pending in this application.

The Applicant respectfully submits that claims 1, 5-6, 8-12, and 17-19 are not unpatentable over Wilson in view of Brown, because even if Wilson and Brown were combined as suggested by the Examiner, the result would not be the present invention as claimed.

The present invention relates to an acoustic liner, comprising a top sheet having substantially linear characteristics and a liner core or cavity, wherein the top sheet comprises a layer of metallic foam.

Wilson discloses a noise attenuation panel 10. The panel comprises a top sheet 122 and a liner core or cavity 121. The top sheet 122 is made from a porous permeable thermoplastics material (col. 3, lines 45-47), and the facing sheet 14 comprises a sheet of a porous permeable thermoplastics material (col. 3, lines 66-68). Thus, the top sheet 122 and the facing sheet 14 are both made of a thermoplastic material. In column 5, lines 53-57 it is also stated that they are made from compatible bonding thermoplastics materials. Brown discloses a metallic foam used as an absorptive layer of an acoustic liner. However, even when Wilson and Brown are combined as disclosed by the Examiner, the result still does not disclose or suggest the requirements of claims 1, and 20.

In particular, claims 1 and 20 require that the top sheet have substantially linear characteristics. As described in the specification, substantially linear characteristics mean that the noise absorption characteristics of the acoustic liner are substantially independent of both temperature and flow. The flow may vary depending on the exhaust gas flowing from the engine. The claimed acoustic liner works independently of the flow and so works well at high, medium and low gas flows. Further, the claimed acoustic liner also works independently of the temperature. Thus, the acoustic liner works at both high and low temperatures. A material which works at high temperatures is required, for example, by claim 18,

since the acoustic liner may be used at the outlet of an engine, for example, by claim 19. However, the required material also works at low temperatures. The inventors have found that when the top sheet has linear characteristics, which are obtained by the top sheet comprising a layer of metallic foam, the material will absorb noise independently of temperature and independently of flow. Neither Wilson, nor Brown discloses a top sheet that has substantially linear characteristics. Indeed, neither Wilson nor Brown discloses linear characteristics at all. Thus, the combination of Wilson and Brown does not disclose or suggest a top sheet that has substantially linear characteristics.

The claimed acoustic liner has solved a problem with absorbing noise which has not been solved earlier. For example, an advantage of the claimed is that it will work very well at the outlet of the engine both when the engine is cold and when the engine is hot. Further, the liner will also work very well at different flows, and the independence of the temperature and the flow will work concurrently. In addition, the temperature may differ at different points on the same liner at the outlet of an engine. This depends on the distance from the gas outlet and the distance the gas has been transported from the engine. The claimed liner then works over the whole area, even if the temperature varies over the liner. No adapting of the liner has to be done in order to absorb noise over different temperature zones. Thus, the combination of Wilson and Brown does not disclose or suggest the claimed structure, and the combination of Wilson and Brown does not disclose or suggest these advantages of the claimed liner.

In addition, one of skill in the art would not be properly motivated to combine Wilson and Brown as suggested by the Examiner. The panel disclosed by Wilson is made of thermoplastic material and is intended for use with cold gas flows. In column 4, line 61 to column 5, line 24, are several advantages mentioned for the panel disclosed in Wilson. For example, it is stated in point 2 that the powder sintering technique provides a highly complex interference flow path as a result of which the noise attenuation properties are greatly enhanced. Further, the smooth surface of the facing sheet has substantial acoustic/air flow advantages over other perforate and porous forms (point 3), there is no problem with metal galvanic corrosion (5) and the panel is lighter (6). Thus, Wilson teaches away from using metal as part of the disclosed structure, as using thermoplastic material will avoid the problems with that Wilson identifies.

It would therefore not have been obvious to exchange the plastic layer of foam in the panel in Wilson with metallic foam as used in Brown. To insert a layer as in Brown would have removed the advantages stated above. The motivation for using the metallic foam is to obtain the substantially linear characteristics. Wilson and Brown do not disclose or suggest linear characteristics. Thus, there is no suggestion in Wilson or Brown to produce a structure that has linear characteristics. A liner with linear characteristics works at both high and low temperatures and at the same time works with different flows. Thus, the panel in Wilson would be used for lower temperatures, and there would be no desire to be able to withstand higher temperatures. Besides, the advantages with the smooth

surface and a light panel would have been lost. Thus, one of skill in the art would not be properly motivated to try to use the materials disclosed by Brown.

Therefore, claims 1 and 20, and claims 5-6, 8-12, and 17-19, which depend therefrom, are not unpatentable over Wilson in view of Brown.

The Applicant respectfully submits that the present invention, according to claims 2-4 is not unpatentable over Wilson in view of Brown, and further in view of Arcas, because even if Wilson, Brown, and Arcas were combined as suggested by the Examiner, the result would not be the present invention as claimed.

Arcas discloses an acoustic attenuating liner that has a non-metallic honeycomb core bonded on a backsheet. A corrosion insulated perforated sheet is bonded to the honeycomb core by adhesive between the perforated sheet and the core. Arcas discloses a graphite epoxy weave, not a metallic foam, Arcas provides no disclosure or suggestion of obtaining any particular non-linearity factor in a metallic foam. Thus, nothing further is shown by Arcas that would lead a skilled person to the solution according to the present invention in claims 2-4. As a result, Arcas does not disclose or suggest the requirement of the present invention, for example, claim 1, for a top sheet having substantially linear characteristics.

Thus, the combination of Wilson, Brown, and Arcas still does not does not disclose or suggest the requirement of the present invention, for example, claim 1, for a top sheet having substantially linear characteristics.

Therefore, claims 2-4 are not obvious over Wilson in view of Brown, and further in view of Arcas.

The Applicant respectfully submits that the present invention, according to claim 7 is not unpatentable over Wilson in view of Brown, and further in view of Kraft, because even if Wilson, Brown, and Kraft were combined as suggested by the Examiner, the result would not be the present invention as claimed.

Kraft discloses an acoustic treatment for the air ducts of a gas turbine engine. The acoustic treatment generally includes a facesheet having a plurality of holes therein, a backplate spaced apart from the facesheet, and a plurality of interconnected cells between the facesheet and backplate. Each of the cells is defined by walls attached to the facesheet and the backplate, and at least some of the walls are formed of a porous material so that air is able to flow through the cells in a direction parallel to the facesheet and backplate. Kraft makes no mention of metallic foam or of linear characteristics. Thus, Kraft does not disclose or suggest the requirement of the present invention, for example, claim 1, from which claim 7 depends, for a top sheet having substantially linear characteristics.

Thus, the combination of Wilson, Brown, and Kraft still does not does not disclose or suggest the requirement of the present invention, for example, claim 1, for a top sheet having substantially linear characteristics.

Thus, claim 7 is not obvious over Wilson in view of Brown, and further in view of Kraft.

The Applicant respectfully submits that the present invention, according to claims 13-16 is not unpatentable over Wilson in view of Brown, and further in view of Lowery, because even if Wilson, Brown, and Lowery were combined as suggested by the Examiner, the result would not be the present invention as claimed.

Lowery discloses a perforated cellular sound absorption material made of a material such as polyurethane. Lowery makes no mention of metallic foam or of linear characteristics. Thus, Lowery does not disclose or suggest the requirement of the present invention, for example, claim 1, from which claims 13-16 depend, for a top sheet having substantially linear characteristics.

Thus, the combination of Wilson, Brown, and Lowery still does not does not disclose or suggest the requirement of the present invention, for example, claim 1, for a top sheet having substantially linear characteristics.

Thus, claims 13-16 are not obvious over Wilson in view of Brown, and further in view of Lowery.

The Applicant respectfully submits that the present invention, according to claim 20 is not unpatentable over Wilson in view of Brown, and further in view of Ely, because even if Wilson, Brown, and Ely were combined as suggested by the Examiner, the result would not be the present invention as claimed.

Ely discloses a sound-suppressing panel for use on the surface of a structure adjacent which a fluid is to flow. Ely makes no mention of metallic foam or of linear characteristics. Thus, Ely does not disclose or suggest the requirement of

the present invention, for example, claim 20, for a top sheet having substantially linear characteristics.

Thus, the combination of Wilson, Brown, and Ely still does not disclose or suggest the requirement of the present invention, for example, claim 20, for a top sheet having substantially linear characteristics.

Thus, claim 20, and claim 21, which depends therefrom, are not obvious over Wilson in view of Brown, and further in view of Ely.

The Applicant respectfully submits that the present invention, according to claim 22-25 is not unpatentable over Wilson in view of Brown, further in view of Ely, and further in view of Lowery, because even if Wilson, Brown, Ely, and Lowery were combined as suggested by the Examiner, the result would not be the present invention as claimed.

As discussed above, none of Wilson, Brown, Ely, and Lowery discloses or suggests a top sheet having substantially linear characteristics. Thus, the combination of Wilson, Brown, Ely, and Lowery still does not does not disclose or suggest the requirement of the present invention, for example, claim 22-25, for a top sheet having substantially linear characteristics.

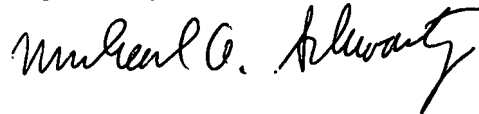
Thus, the present invention, according to claim 22-25 is not obvious over Wilson in view of Brown, further in view of Ely, and further in view of Lowery.

Each of the claims now pending in this application is believed to be in condition for allowance. Accordingly, favorable reconsideration of this case and early issuance of the Notice of Allowance are respectfully requested.

Additional Fees:

The Commissioner is hereby authorized to charge any insufficient fees or credit any overpayment associated with this application to Deposit Account No. 50-4047 (25880.0066).

Respectfully Submitted,

A handwritten signature in black ink, appearing to read "Michael A. Schwartz", written in a cursive style.

Michael A. Schwartz
Reg. No. 40,161

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Bingham McCutchen, LLP
2020 K Street, N.W.
Washington, D.C. 20006
Telephone: (202) 373-6000
Facsimile: (202) 373-6440